

10/523460

AMENDMENTS TO THE CLAIMS PCT/EP01/06701 PCT/PTC 06 FEB 2005

The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-4. (Cancelled)

5. (New) A hole-assisted single mode optical fiber comprising:  
a first cladding region having a uniform refractive index;  
a core region with a radius  $r_1$  having a refractive index higher than that of said first cladding region, and placed at a center of said first cladding region; and  
a second cladding region including at least four air hole regions, each of which has a radius  $r_2$ , is separated by a distance  $d$  from a center of said core region, and is placed in said first cladding region, wherein  
the distance  $d$  is 2.0 to 4.5 times the radius  $r_1$  of said core region, and the radius  $r_2$  of said air hole regions is equal to or greater than 0.2 times the radius  $r_1$  of said core region, and wherein  
said hole-assisted single mode optical fiber has zero-dispersion wavelength characteristics conforming to the ITU-T recommendation G.652 in a range from 1300 nm to 1324 nm, and has a bending loss characteristics equal to or less than 1 dB/m at a bending radius 10 mm, and variations in a mode field diameter by providing said air hole regions is equal to or less than  $\pm 10\%$ .

6. (New) The hole-assisted single mode optical fiber as claimed in claim 1, wherein the radius  $r_1$  of said core region is from ~~3.2~~ 3.7  $\mu\text{m}$  to  $4.8 \mu\text{m}$ , and a relative index difference  $\Delta$  of said core region from said first cladding region is in a range from 0.3% to 0.55%.

7. (New) A hole-assisted single mode optical fiber comprising:
- a first cladding region having a uniform refractive index;
  - a core region with a radius  $r_1$  having a refractive index higher than that of said first cladding region, and placed at a center of said first cladding region; and
  - a second cladding region including at least four air hole regions, each of which has a radius  $r_2$ , is separated by a distance  $d$  from a center of said core region, and is placed in said first cladding region, wherein
    - a relative index difference  $\Delta$  of said core region from a refractive index of said first cladding region is in a range from 0.05% to 0.12%, an effective core radius  $A$  from the center of said core region to an extreme circumference of said air hole regions is in a range from 23  $\mu\text{m}$  to 28  $\mu\text{m}$ , and wherein
    - said hole-assisted single mode optical fiber has a theoretical cutoff wavelength characteristics equal to or less than 1100 nm, a bending loss equal to or less than 1 dB/m at a bending radius 10 mm, and effective core radius characteristics equal to or greater than 150  $\mu\text{m}^2$  in a wavelength range from 1260 nm to 1625 nm.